

CLAIMS

What is claimed is:

1. An air purifier, comprising:
  - a main body to suck and discharge air;
  - a dust collecting pat to collect dust particles;
  - a functional filter to enhance a purification function to predetermined contaminants in the air and to be replaceable on a basis of types of contaminants to be purified; and
  - a deodorizing filter to remove odors from air,wherein the dust collecting part, the functional filter and the deodorizing filter are received into the main body to remove the contaminants from the air sucked into the main body.
2. The air purifier of claim 1, wherein a replacing port of the functional filter to be replaceable on the basis of the types of contaminants to be purified is formed on the main body.
3. The air purifier of claim 2, wherein the replacing port of the functional filter is formed at any one portion of a side surface and a top surface of the main body.
4. The air purifier of claim 1, wherein the dust collecting part comprises a washable material.
5. The air purifier of claim 1, wherein the dust collecting part comprises:
  - a pre-filter received into the main body to collect impurities larger than dust particles;
  - an ionizer to charge dust particles electrically;
  - an electrostatic filter exhibiting static electricity to collect the dust particles charged in the ionizer;
  - a metal filter including a fabric material inserted between two metal nets; and
  - a high density filter to collect micro-contaminants.
6. The air purifier of claim 5, wherein an electrically charged polarity of the ionizer is opposite to a polarity of the metal filter.
7. The air purifier of claim 5, wherein the fabric material comprising the metal filter is a metal.

8. The air purifier of claim 5, wherein the fabric material comprising the metal filter is polypropylene.

9. The air purifier of claim 5, wherein the high-density filter is a HEPA filter.

10. The air purifier of claim 1, wherein the functional filter comprises a functional material confined in micropores of carbon nanotubes, and has a purification function of contaminants corresponding to the functional material.

11. The air purifier of claim 1, wherein the functional filter comprises nano-sized titanium oxide confined in carbon nanotubes, and functions to remove odors from the air to deodorize the air.

12. The air purifier of claim 1, wherein the functional filter comprises silver confined in micropores of carbon nanotubes, and functions to remove hazardous bacteria in the air to sterilize the air.

13. The air purifier of claim 1, wherein the functional filter comprises nickel confined in micropores of carbon nanotubes, and functions to remove volatile organic compounds.

14. An air purifier, comprising:

a main body to suck and discharge air;

a dust collecting part to collect dust particles;

a high-density filter to remove micro-contaminants; and

a deodorizing part to remove odors and predetermined gases from air,

wherein the dust collecting part, the high-density filter and the deodorizing part are received into the main body to remove the contaminants from the air sucked into the main body.

15. The air purifier of claim 14, wherein the dust collecting part comprises a washable material.

16. An air purifier, comprising:

a prefilter received into the main body to collect impurities larger than dust particles;

an ionizer to electrically charge dust particles;  
an electrostatic filter exhibiting static electricity to collect the dust particles charged in the ionizer; and  
a metal filter including a fabric material inserted between two metal nets.

17. The air purifier of claim 16, wherein an electrically charged polarity of the ionizer is opposite to a polarity of the metal filter.

18. The air purifier of claim 16, wherein the fabric material comprising the metal filter is a metal.

19. The air purifier of claim 16, wherein the fabric material comprising the metal filter is polypropylene.

20. The air purifier of claim 14, wherein the high-density filter is a HEPA filter.

21. The air purifier of claim 14, wherein the deodorizing part comprises:  
a functional filter to enhance a purification function to remove predetermined contaminants in air and to be replaceable on a basis of types of contaminants to be purified; and  
a deodorizing filter to remove odors from air.

22. The air purifier of claim 21, wherein a replacing port of the functional filter to be replaceable on the basis of the types of the contaminants to be purified is formed on the main body.

23. The air purifier of claim 22, wherein the replacing port of the functional filter is formed at any portion of a side surface and a top surface of the main body.

24. The air purifier of claim 21, wherein the functional filter comprises a functional material confined in micropores of carbon nanotubes, and has a purification function of contaminants corresponding to the functional material.

25. The air purifier of claim 21, wherein the functional filter comprises titanium oxide confined in micropores of carbon nanotubes, and functions to remove odors from the air to deodorize the air.

26. The air purifier of claim 21, wherein the functional filter comprises silver confined in micropores of carbon nanotubes, and functions to remove hazardous bacteria in the air to sterilize the air.

27. The air purifier of claim 21, wherein the functional filter comprises nickel confined in micropores of carbon nanotubes, and functions to remove volatile organic compounds (VOCs) from the air to eliminate harmful gases in the air.

28. The air purifier of claim 21, wherein the deodorizing filter comprises two sheets, each coated with a photocatalytic material and an ultraviolet light source mounted therebetween.

29. An air purifier, comprising:  
a dust collecting unit, to charge dust particles electrically and to collect the dust particles by electrostatic attraction; and  
a HEPA filter, to collect micro-contaminants.

30. The air purifier of claim 29, wherein the dust collecting unit includes:  
an ionizer, to charge dust particles electrically; and  
an electrostatic collector, to collect the dust particles by electrostatic attraction.

31. The air purifier of claim 30, further including at least one of:  
a metal filter, located immediately prior to the HEPA filter, to collect the dust particles charged in the dust collecting unit; and  
a functional filter, located immediately following the HEPA filter.

32. The air purifier of claim 31, wherein the functional filter is a photocatalytic filter.

33. The air purifier of claim 31, wherein the functional filter comprises a functional material confined in micropores of carbon nanotubes, and has a purification function of contaminants corresponding to the functional material.

34. The air purifier of claim 31, wherein the functional filter comprises titanium oxide confined in micropores of carbon nanotubes, and functions to remove odors from the air to deodorize the air.

35. The air purifier of claim 31, wherein the functional filter comprises silver confined in micropores of carbon nanotubes, and functions to remove hazardous bacteria in the air to sterilize the air.

36. The air purifier of claim 31, wherein the functional filter comprises nickel confined in micropores of carbon nanotubes, and functions to remove volatile organic compounds.